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October 18, 2017
GO2-17-178

10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397
LICENSEE EVENT REPORT NO. 2017-004-00**

Dear Sir or Madam:

Transmitted herewith is Licensee Event Report No. 2017-004-00 for Columbia Generating Station. This report is submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A).

There are no commitments being made to the Nuclear Regulatory Commission by this letter. If you have any questions or require additional information, please contact Ms. D.M. Wolfgramm, Regulatory Compliance Supervisor, at (509) 377-4792.

Executed on this 17 day of October, 2017.

Respectfully,

R. E. Schuetz
Vice President, Operations

Attachment: Licensee Event Report 2017-004-00

cc: NRC Region IV Regional Admin
NRC Region IV Project Manager
NRC Senior Resident Inspector/988C
C.D. Sonoda – BPA/1399
W.A. Horin – Winston & Strawn

**LICENSEE EVENT REPORT (LER)**
(See Page 2 for required number of digits/characters for each block)(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Columbia Generating Station

2. DOCKET NUMBER

05000 397

3. PAGE

1 OF 3

4. TITLE

MANUAL REACTOR SCRAM DUE TO HIGH MAIN CONDENSER BACK PRESSURE

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
08	20	2017	2017	004	00	10	17	2017	FACILITY NAME	DOCKET NUMBER	
										05000	
										05000	
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
1			<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)
			<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)
			<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)
			<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)
100			<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)
			<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)
			<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(1)
			<input type="checkbox"/> 20.2203(a)(2)(v)			<input type="checkbox"/> 50.73(a)(2)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(2)(i)
			<input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(ii)
						<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> OTHER		Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

Desiree Wolfgramm, Regulatory Compliance Supervisor

TELEPHONE NUMBER (Include Area Code)

(509) 377-4792

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
E	SH	V	A610	Y	B	SH	V	M120	Y

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 20, 2017 at 1605 PDT, Columbia Generating Station was manually scrambled due to a rise in Main Condenser back pressure. The rise in back pressure was due to the spurious closure of the Main Condenser Air Removal Suction Valve (AR-V-1) as a result of the failure of its associated solenoid pilot valve. Following the reactor scram and depressurization of the reactor a Level 3 actuation occurred. In addition a startup flow control valve failed which necessitated throttling of the Feedwater start-up level control isolation valve to control Reactor Pressure Vessel level. All other safety systems functioned as expected and all control rods were fully inserted. Reactor decay heat was removed via bypass valves to the main condenser.

The apparent cause was the plant modification to address the single point vulnerability of the closure of AR-V-1 was not implemented in time to prevent a plant shutdown. A temporary modification has been installed to maintain AR-V-1 open for the remainder of the operating cycle.

These events are reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A).

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Columbia Generating Station	05000-397	2017	004	00

NARRATIVE**PLANT CONDITIONS**

At the time of the event, Columbia Generating Station (Columbia) was in Mode 1 operating at 100% reactor power. There were no safety related systems out of service prior to the event.

EVENT DESCRIPTION

On August 20, 2017 at 1605, in response to rising main condenser [SG] backpressure due to the Main Condenser Air Removal Suction Valve [SH] [V] (AR-V-1) failing closed, control room operators initiated a manual reactor scram after reducing reactor power to 80%. The main turbine [TA] and generator [TB] tripped due to the main condenser backpressure transient and both Reactor Recirculation (RRC) Pumps [AD] [P] tripped when an automatic signal was generated by the main turbine trip.

All rods fully inserted and the Main Steam Isolation Valves [SB][V](MSIVs) stayed open. Following the initial transient a subsequent Reactor Pressure Vessel [AB] [RPV] (RPV) low water level (Level 3) actuation occurred due to operator action per plant procedure to reduce RPV pressure, and level restored automatically with no operator action. Startup Flow Control Valve [SK] [V] (RFW-FCV-10B) then failed to automatically control RPV water level resulting in a RPV high water level (Level 8) trip and level was restored by throttling Reactor Feedwater Flow Control Valve [SK] [V] (RFW-V-118) per plant procedure. All other safety systems operated as designed.

All other plant systems responded as expected with the following exceptions: The Mode Switch [JC] [HS] was reportedly difficult to turn but did not impede the capability to scram. Reactor Feedwater Turbine Turning Gear [TA] [TGR] (RFT-DT-A) would not stay engaged; operator action was required to keep it engaged. These equipment issues did not impact the safety significance of the event.

IMMEDIATE CORRECTIVE ACTION

A temporary modification to gag open AR-V-1 for the remainder of the operating cycle has been implemented.

CAUSE

The direct cause of the shutdown was failure of Solenoid Pilot Valve [SK] [V] (AR-SPV-1/1) due to thermal aging which resulted in unexpected closure of AR-V-1. The apparent cause was a plant modification to address the known single point vulnerability (closure of AR-V-1) was not implemented in time to prevent a plant shutdown. The contributing cause was the management decision to not include the maintenance task to replace AR-SPV-1/1 in the most recent refueling outage.

EXTENT OF CONDITION

A review of all single point vulnerable components was conducted. The scope of the review included all normally energized components that could change state and cause a plant trip if electrical power were lost. The review revealed three relays that are in a normally energized state but were within their required replacement frequency.

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Columbia Generating Station	05000- 397	2017	- SEQUENTIAL NUMBER 004	- 00

NARRATIVE**PLANNED CORRECTIVE ACTIONS**

Planned corrective actions include the following:

Eliminate the single point vulnerability of AR-V-1.

Develop and present a case study to station management placing emphasis on the timeliness and sensitivity of Single Point Vulnerability (SPV).

Revise the work and project management processes to align station priority for SPVs in Long Range Planning and Minor Modifications.

Review station SPVs to understand collateral effects from associated subcomponents and categorize appropriately.

For continuously energized components supporting function of SPVs, assess preventive maintenance tasks for adequacy to support a policy for zero failures.

ASSESSMENT OF SAFETY CONSEQUENCES

All control rods inserted in response to the manual scram and the MSIVs stayed open, thus the main condenser remained an available heat sink (via bypass valves) for decay heat control. RFW-FCV-10B failed to function automatically which necessitated throttling RFW-V-118 to control RPV level in accordance with plant procedures. All safety systems operated as designed and the plant safely entered Mode 4 without further challenges. The significance of this event was limited to loss of power operations.

PREVIOUS OCCURENCES

A review of Columbia LERs for the past three years was also performed and did not identify any previously reported similar events.

ENERGY INDUSTRY IDENTIFICATION

Energy Industry Identification System (EIIS) Information codes from IEEE Standards 805-1984 and 803-1983 are represented in brackets as [XX] and [XXX] throughout the body of the narrative.